



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,078	07/26/2005	Andrej Kitanovski	NITROS P171US	2645
20210 7590 04/21/2008 DAVIS BUJOLD & Daniels, P.L.L.C. 112 PLEASANT STREET CONCORD, NH 03301				
EXAMINER				
DOERRLER, WILLIAM CHARLES				
ART UNIT		PAPER NUMBER		
3744				
MAIL DATE		DELIVERY MODE		
04/21/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/540,078

**Applicant(s)**

KITANOVSKI ET AL.

**Examiner**

William C. Doerrler

**Art Unit**

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21-31 and 33-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In lines 3 and 4 of claim 21, lines 5 and 6 of claim 33 and lines 6 and 7 of both claims 37 and 39, it is claimed that the fluid comprises a magneto-calorific material a superconductor or a phase change material or combinations thereof. However, if the fluid consists of a phase change material without a superconductor or magneto-calorific material, it is unclear how the system will work, as no refrigeration will be generated. The claims would be clearer if changed to "comprising a magneto-calorific material or a superconductive material or mixtures thereof and possible a phase change material". Since the term comprising is open language, applicant can delete the phase change material and it could still be present in the device covered by the claims. The other claims depend from claim 21,33,37 or 39, so they are unclear by their dependency.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21-27,30,31,33,35 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Burnett (5,231,834).

Burnett discloses a mango-caloric heat transfer system with electromagnets used to controllably magnetize a suspension of magneto-caloric particles which are circulated in a fluid (see column 2 lines 54-65). The superconductive magnets are seen as electromagnets that generate a variable magnetic field. The fluid is seen as a nano-fluid due to the small size of the particles therein. As the suspension of the particles in the fluid is used to generate the temperature difference, and transport it to the heat transfer fluids in the heat exchangers, the fluid is seen as a multi-function fluid. It is noted that in line 18 of column 4, that Burnett states that a single heat exchanger can be used. The fluids flowing from the second heat exchanger is seen as thermally isolated from the fluid leaving the first heat exchanger as the fluid leaving the second heat exchanger passes through line 12 in figure 1, which is separated from line 80 connecting the first and second heat exchangers. Line 42 of column 4 states that the fluid develops a low temperature on leaving the magnetic bore surrounding the first heat exchanger. Lines 74 and 76 transport the heat transfer fluid through a heating circuit. Lines 96 and 98 are the legs of the cooling fluid circuit.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 28,29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett.

Burnett discloses applicants' basic inventive concept, a magneto-caloric heating and cooling method with a fluid of liquid with a suspension of magneto-caloric particles circulating through a magnetic field and a hot and cold heat exchanger, substantially as claimed with the exception of the size of the particles and using a permanent magnet. The size of the particles is seen as a matter of obvious design choice to an ordinary practitioner in the art, who would try to maximize the heat transfer from the system, while still ensuring the fluid can efficiently flow through the system. Permanent magnets

are well known in the art and would have been obvious to an ordinary practitioner in the art to provide a magnetic field that is constant and does not require energy input to provide the magnetic field. Applicant has not provided any details or test results showing that any of the above provide non-obvious results are have a degree of criticality to the functioning of the system.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett in view of Kahn.

Burnett discloses applicants' basic inventive concept, a heating and cooling method which circulates particles through a magnetic field and through hot and cold heat exchangers, substantially as claimed with the exception of using superconducting particles. Kahn shows the use of superconductors to provide a temperature difference by an alternating magnetic field to be old in the temperature change generation art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Kahn to use superconducting particles to generate a temperature change by flowing into and out of a magnetic field to provide a temperature change efficiently.

#### ***Allowable Subject Matter***

Claims 37-40 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

#### ***Response to Arguments***

Applicant's arguments filed 2-26-2008 have been fully considered but they are not persuasive. Line 18 of column 4 of Burnett states that single heat exchangers can

be used. The embodiment of figure 2 of Burnett uses heat transfer between lines connecting the first and second heat exchanger, but there is no such heat transfer in the embodiment of figure 1 (which the above cite is referring to).

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3744

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William C Doerrler/  
Primary Examiner, Art Unit 3744

WCD